



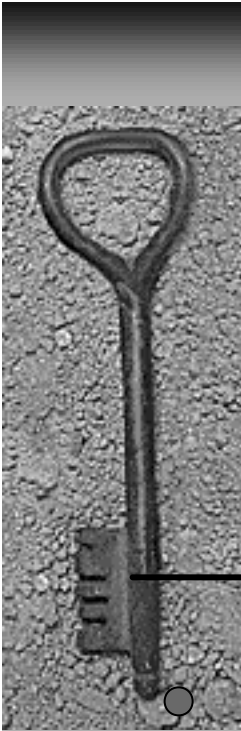
The Joint Service Small Arms Program (JSSAP)



Current And
Long Term Threat
To The Future US
Ground Combatant



Stephen C. Small, Ph. D.



Agenda

**On The Mid And Long
Term Threat To The
Future US Ground
Combatant**

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The Operational Environment

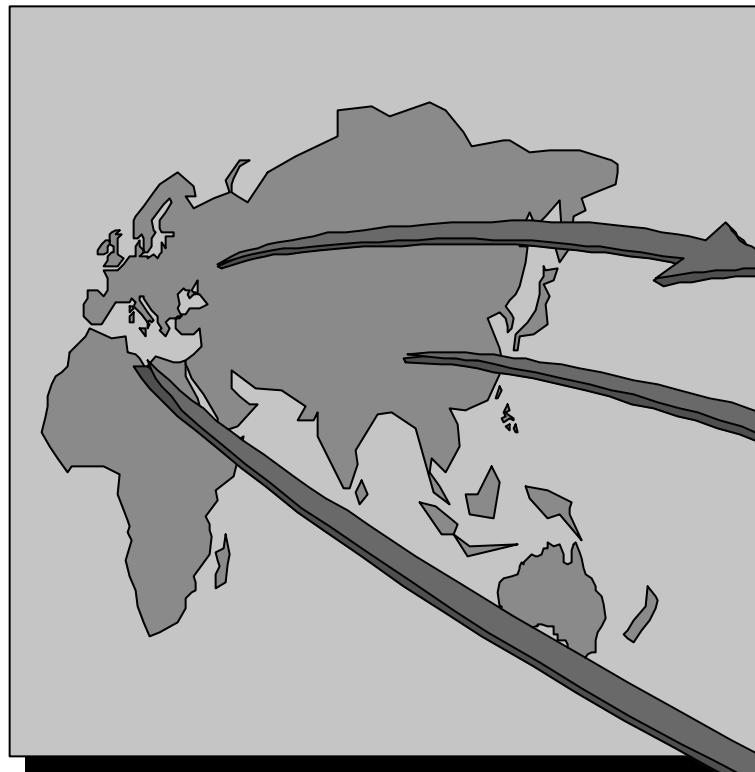
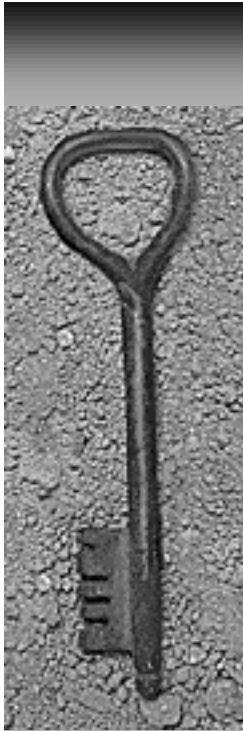
Small Arms: Mid And Long Term

Human And Material Targets

Threats To Speed And Information

**Summary, Recommendation And Open
Questions**

The Mid (2005-15) And Long Term (2015-20) Threat



Regional Threats

Eastern Europe

China
✓ Korea
✓ Russia

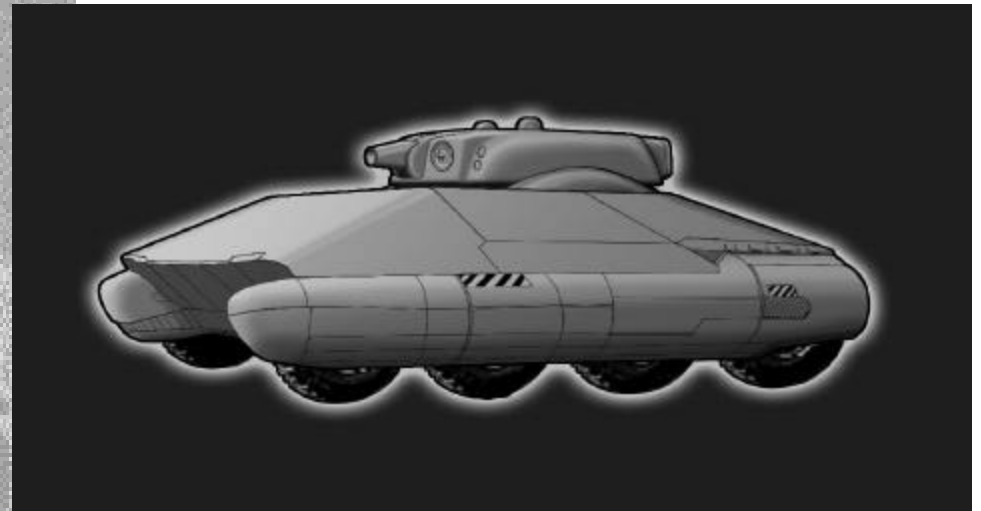
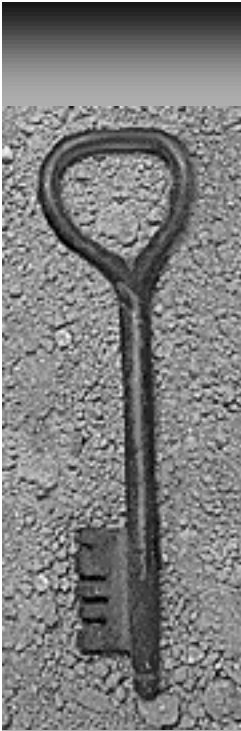
Middle East
India-Pakistan

Strategic Threats

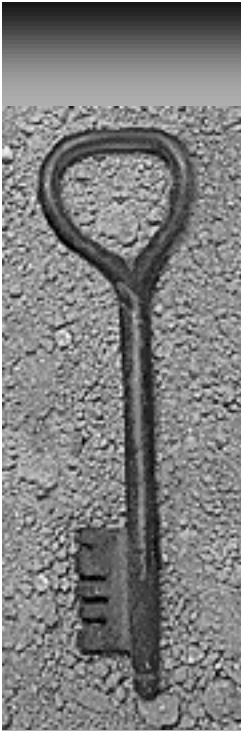
- ✓ China
- ✓ Russia

Future Warfare

- Information superiority
- Dominate maneuver
- Precision engagements
- Full dimensional protection
- Focused logistics
- Minimize escalation to Weapons of Mass Destruction



Close Quarter Battle



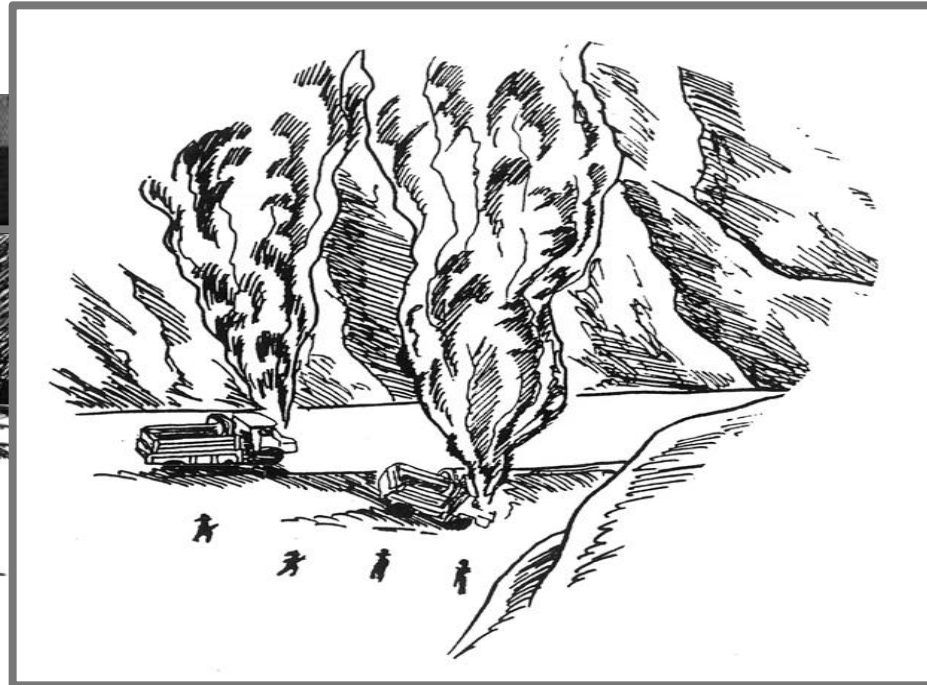
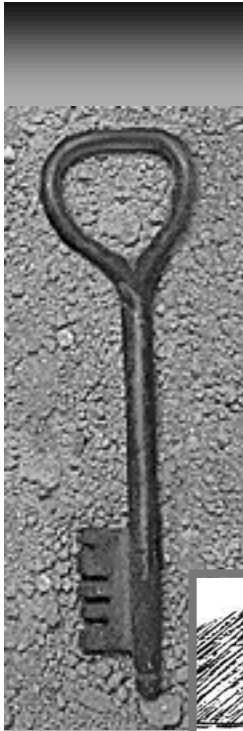
Densely Wooded Terrain



Urban Terrain



Standoff Combat



Extended Open Areas

Engagement Ranges

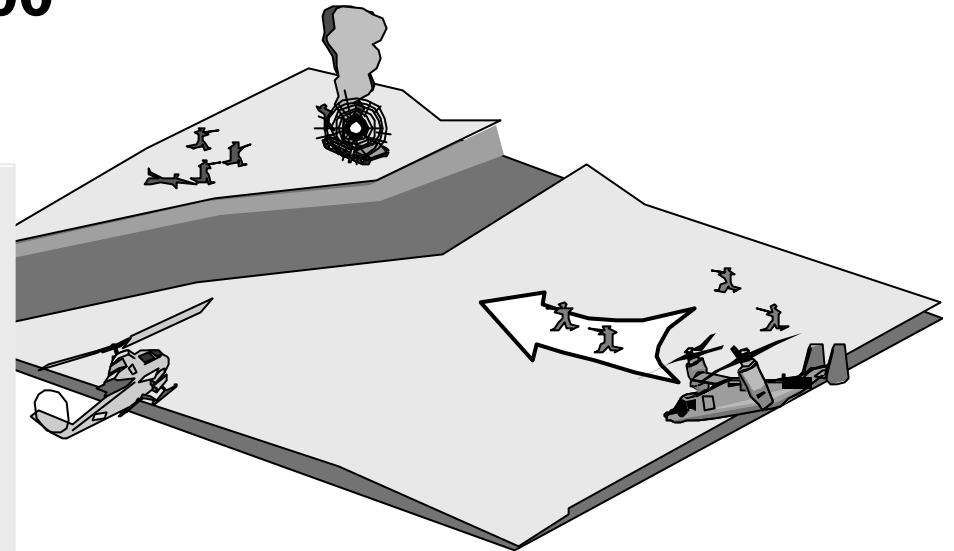
Close Quarter Battle

Arms Length To 300/400 meters



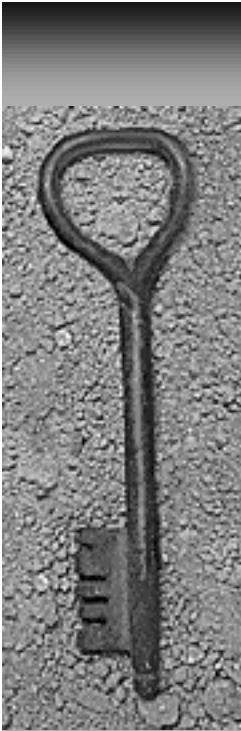
Standoff Battle

**400/500 meters To
3/5 kilometers**



Threats To Speed And Information

- Intensionality
- Robots, and Cyber Scouts
- Ground Attack Aircraft
- Depolymerization Agents
- Direct & Indirect Large Caliber Fire
- Unattended Ground-Sensor-Systems
- The News Media



Threat Small Arms Targets

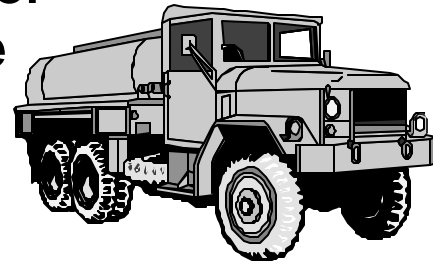
Ground Combatants

- Individual
- Groups
- With, W/O Body Armor
- Visible Or In Defilade



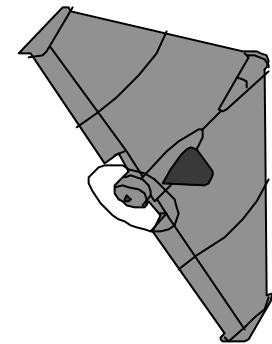
Thin-Skinned Vehicles

- Automobiles
- Trucks
- Watercraft

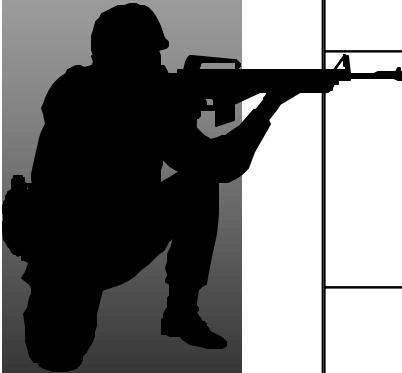
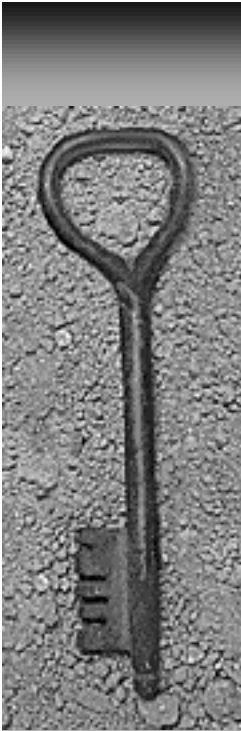


High Value Targets

C⁴I SAR

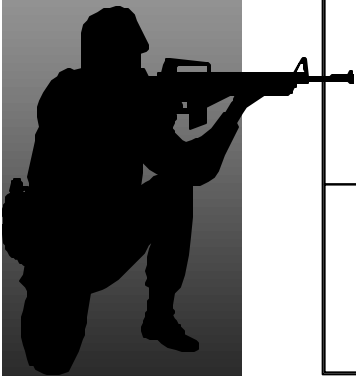
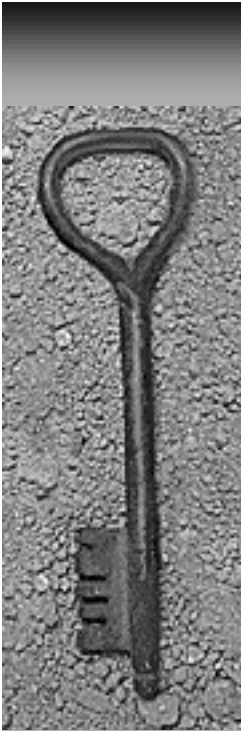


The Human Target And It's Defeat – Exposure Dimensions In Meters



Man as a target	Width	height	area (m2)
Standing	0.454	1.486	.675
Crouching/ Kneeling	0.495	0.861	.426
Prone	0.660	0.353	.232
Foxhole	0.495	0.375	.186

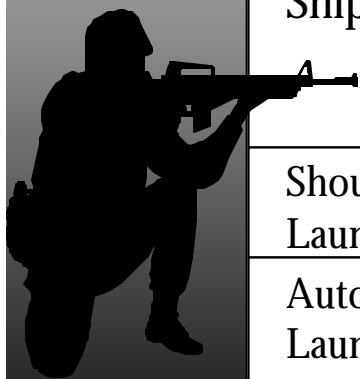
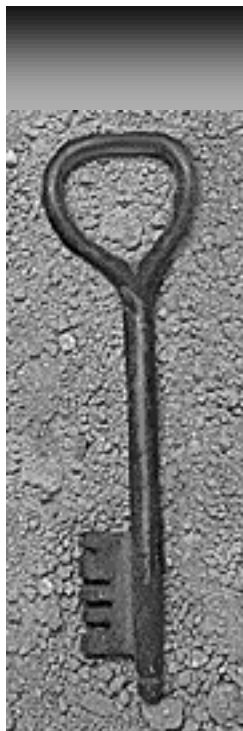
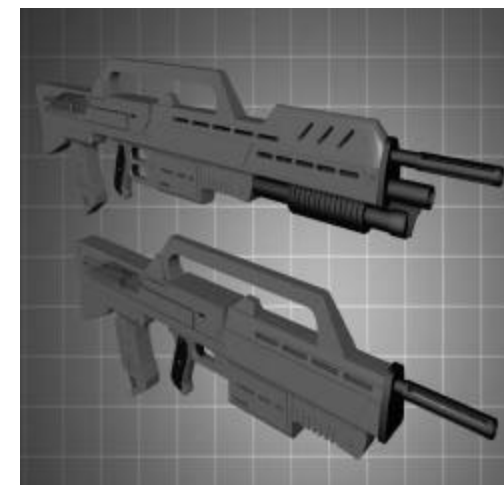
The Human Target And It's Defeat – Exposure Times

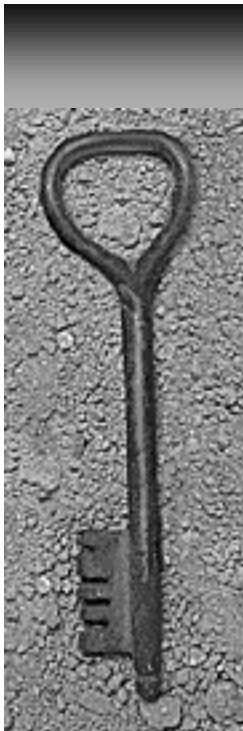


Historic man target engagement data*	typical distances in meters	typical Exposure times in seconds
Jungle & MOUT	<100	3-5
Most scenarios (90%)	<300	5-7
Desert	>300	5-7

Kinetic Energy Small Arms

Category & Type	effective range (meters)	calibers
Assault Rifles	400-500	5.45mm & 5.56mm
Light Machine Guns	400-800	5.45mm & 5.56mm
General Purpose Machine Guns	800-1000	6mm & 7.62mm
Heavy Machine Guns	<2000	12.7mm & Cal. 50
Sniper Rifles	Anti-personnel <1000 Anti-Material 1500-2000	7.62mm To 12.7mm
Shoulder-fired Grenade Launchers	300-400	30mm 40mm
Automatic Grenade Launchers	1700-2000	30mm 40mm

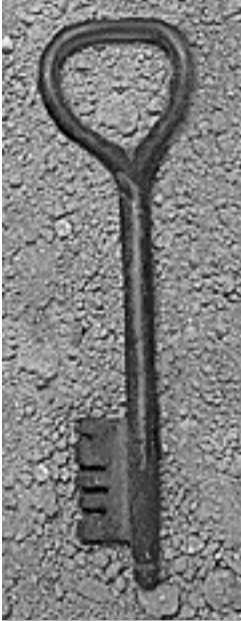




Directed Energy Small Arms

- ◆ High Power Microwaves
- ◆ Particle Beams
- ◆ Lasers & Optical Technologies
- ◆ Acoustics





Summary: Recommendations

- **Adaptable To Asymmetric Combat**



- **The Psychological Aspects of Wounding**

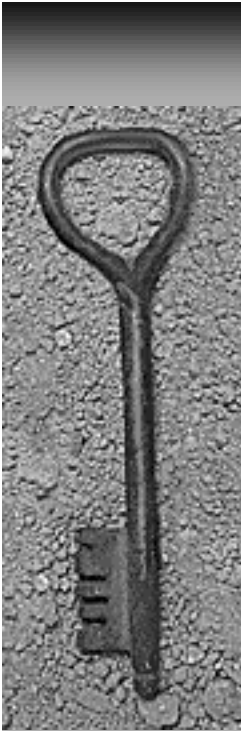


- **Innovations In Protective Garments**

- **The Longer Distances As Well As The Close Quarter Battle**



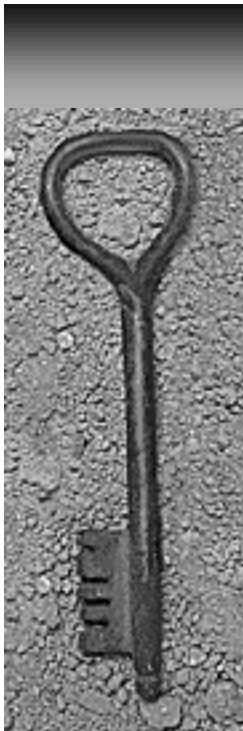
- **To Hit The Moving or Unseen Target**



Summary: Open Questions

- **A “911 Military?”**
- **Low & High Tech Weapons?**
- **Threat and Friendly Transparency?**
- **A Threat Soldier-As-A-System?**
- **What Is The Least Likely But Most Devastating Version Of A Future Threat?**





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